



54/108Mbps Super A+G Wireless Access Point

WDAP-2000PE

User's Manual



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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio technician for help.

FCC Caution:

To assure continued compliance.(example-use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the Following two conditions: (1) This device may not cause harmful interference, and (2) this Device must accept any interference received, including interference that may cause undesired operation.

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm(8 inches) during normal operation.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Revision

User's Manual for PLANET 54/108Mbps Super A+G Wireless Access Point

Model: WDAP-2000PE

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Part No. EM-WDAP2000PE

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Chapter 1

Introduction



PLANET WDAP-2000PE is an IEEE 802.11a+g dual band Wireless Access Point with PoE. With the latest innovative Super A/G technology integrated, the maximum data rate of WDAP-2000PE is 108Mbps, which doubles the speed of standard 802.11a/g. WDAP-2000PE is also backward compatible and interoperable with IEEE 802.11b compliant wireless devices.

Emphasizing on the enterprise demand, WDAP-2000PE enhances many security and management features, including multiple SSIDs, VLAN, QoS, DiffServ support, WPA/WPA2, DoS Prevention and so on. The LAN port of WDAP-2000PE has PoE function conforming to IEEE 802.3af, providing both data transfers and power supply through one Ethernet cable. Therefore, it can be installed anywhere without the constraint on power socket. Provided with two reversed-polarity SMA male connector, WDAP-2000PE is easy to connect external antenna and booster to extend the wireless distance.

1.1 Package Contents

Make sure that you have the following items:

- WDAP-2000PE
- Dipole Antenna x 2
- Quick Installation Guide
- User's manual CD-ROM
- Power Adapter

Note:

If any of the above items are missing or damaged, contact your supplier for support.

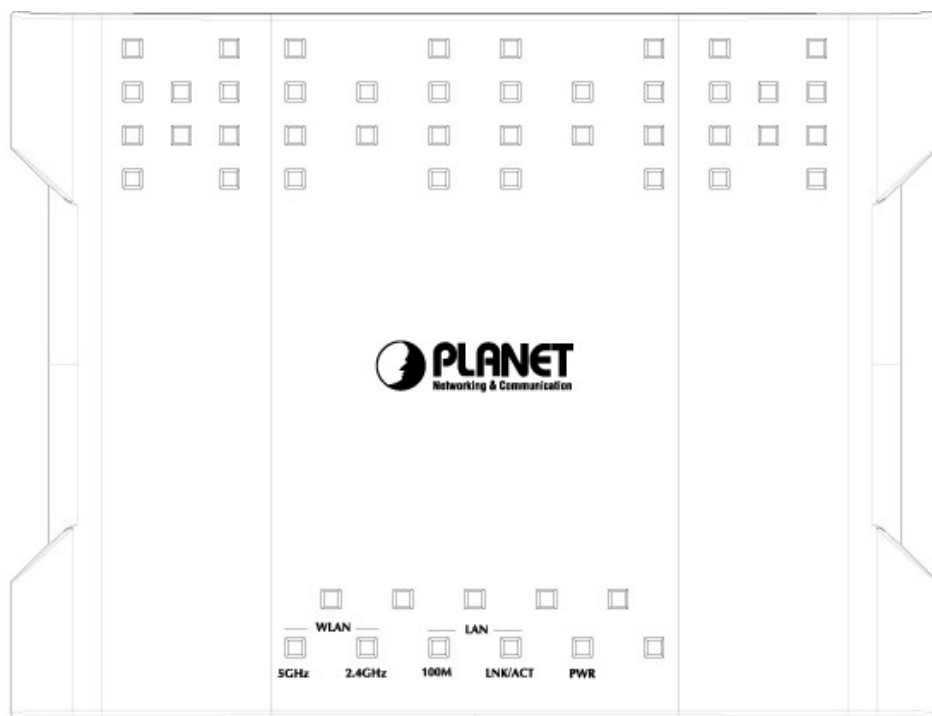
1.2 Features

- Wireless LAN IEEE802.11a+g and IEEE802.11b compliant
- Support PoE port (IEEE802.3af compliant)
- Strong network security with 802.1x authentication, and 64/128/152-bit WEP encryption
- WPA and WPA2* with PSK/TKIP/AES support
- Super A/G mode efficiently raises the data transfer rate up to 108Mbps
- Two operation modes selectable for both 5GHz and 2.4GHz radios: AP / WDS mode
- Adjustable transmit power and data rate
- Watchdog timer, NTP client and basic UPnP support
- Provide Web and CLI (Command Line Interface) Configuration
- SNMP management support (V1/V2, Traps, MIB2, IF MIB, Ether-like MIB, 802.11-MIB)
- Support Multiple SSIDs, 802.1Q VLAN, 802.1p QoS, DiffServ, DoS Prevention, MAC filtering.

* WPA2 feature will be available in the end of 2005 Q3.

1.3 Physical Details

Top View



| LED | | Status Description |
|-------|----------|--|
| POWER | PWR | Steady Green – Power on |
| | | OFF – Power off |
| LAN | Link/Act | Steady Green - Link is active |
| | | Flashing Green - Transmit or receive data |
| | | OFF - No connection |
| LAN | 100M | Steady Green - Link is active on 100M speed |
| | | Flashing Green - Transmit or receive data |
| | | OFF - Link is active on 10M speed |
| WLAN | 5 GHz | Steady Green - Link is active on 802.11a mode |
| | | Flashing Green - Transmit or receive data |
| | | OFF - No connection |
| WLAN | 2.4GHz | Steady Green - Link is active on 802.11b/g mode |
| | | Flashing Green - Transmit or receive data |
| | | OFF - No connection |

Rear View



| Connector | Description |
|---------------------|--|
| ANT | Two dipole antennas are supplied. Best result is usually obtained with the antenna in a vertical position. |
| Power | Connect the supplied power adapter here. |
| Reset Button | In order to clear ALL settings and restore to factory default, holding the Reset Button down continuously for 5 seconds. |
| LAN (PoE) | Use a standard LAN cable (RJ-45 connectors) to connect this port to a 10BaseT or 100BaseT hub on your LAN. |

1.4 Specification

| | |
|------------------------------|--|
| Model | WDAP-2000PE |
| Standard | IEEE 802.11b, 802.11g, 802.11a |
| Signal Type | DSSS (Direct Sequence Spread Spectrum) |
| Modulation | OFDM with BPSK, QPSK, 16QAM, 64QAM, DBPSK, DQPSK, CCK |
| Port | 10/100Mbps RJ-45 port * 1, 802.3af compliant |
| Antenna Connector | Reverse SMA male x 2 |
| Wireless Transmit Power | IEEE802.11a mode: 17dBm@54Mbps 20dBm@6Mbps IEEE802.11g mode: 17dBm@54Mbps 20dBm@11Mbps 20dBm@1Mbps IEEE802.11b mode: 14dBm |
| Wireless Receive Sensitivity | IEEE802.11a mode: -85dBm@6Mbps -65dBm@54Mbps IEEE802.11g mode: -91dBm@1Mbps -84dBm@11Mbps -65dBm@54Mbps |
| Operating Mode | AP, WDS mode |
| Security | WEP, WPA with PSK/TKIP/AES support 802.1x authentication /EAP-TLS/EAP-TTLS/EAP-MD5/EAP-PEAP MAC filtering authorized Block SSID broadcast |

| | | |
|-------------------------------|--|--------------------------------------|
| Management | Web based configuration CLI configuration Message Log Firmware upgrade UPnP support Configuration file Backup/Restore | |
| Data Rate | Super A/G mode | Up to 108Mbps |
| | 802.11g | Up to 54Mbps (6/9/12/18/24/36/48/54) |
| | 802.11b | Up to 11Mbps (1/2/5.5/11) |
| Dimensions (L x W x H) | 190 x 145 x 28mm | |
| Weight | 320g | |
| Environmental Specification | Operating temperature: 0 – 40 degree C | |
| | Storage temperature: -20 – 65 degree C | |
| | Relative humidity: 10% – 90% (non-condensing) | |
| Power Requirement | 5V DC, 2A | |
| Electromagnetic Compatibility | FCC, CE | |

1.6 Wireless Performance

The following information will help you utilizing the wireless performance, and operating coverage of WDAP-2000PE.

1. Site selection

To avoid interferences, please locate WDAP-2000PE and wireless clients away from transformers, microwave ovens, heavy-duty motors, refrigerators, fluorescent lights, and other industrial equipments. Keep the number of walls, or ceilings between AP and clients as few as possible; otherwise the signal strength may be seriously reduced. Place WDAP-2000PE in open space or add additional WDAP-2000PE as needed to improve the coverage.

2. Environmental factors

The wireless network is easily affected by many environmental factors. Every environment is unique with different obstacles, construction materials, weather, etc. It is hard to determine the exact operating range of WDAP-2000PE in a specific location without testing.

3. Antenna adjustment

The bundled antenna of WDAP-2000PE is adjustable. Firstly install the antenna pointing straight up, then smoothly adjust it if the radio signal strength is poor. But the signal reception is definitely weak in some certain areas, such as location right down the antenna.

Moreover, the original antenna of WDAP-2000PE can be replaced with other external antennas to extend the coverage. Please check the specification of the antenna you want to use, and make sure it can be used on WDAP-2000PE.

4. WLAN type

If WDAP-2000PE is installed in an 802.11b and 802.11g mixed WLAN, its performance will be reduced significantly. Because every 802.11g OFDM packet needs to be preceded by an RTS-CTS or CTS packet exchange that can be recognized by legacy 802.11b devices. This additional overhead lowers the speed.

Chapter 2

Installation

2

2.1 General Installation

Before you proceed with the installation, it is necessary that you have enough information about the WDAP-2000PE.

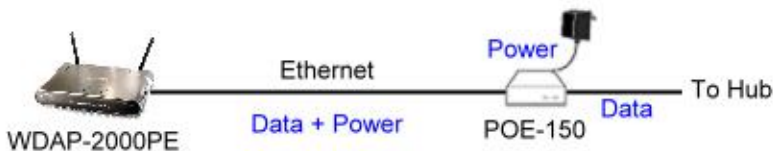
1. **Locate an optimum location for the WDAP-2000PE.** The best place for your WDAP-2000PE is usually at the center of your wireless network, with line of sight to all of your mobile stations.
2. **Assemble the antennas to WDAP-2000PE.** Try to place them to a position that can best cover your wireless network. The antenna's position will enhance the receiving sensitivity.
3. **Connect RJ-45 cable to WDAP-2000PE.** Connect this WDAP-2000PE to your LAN switch/hub or a single PC.
4. **Plug in power adapter and connect to power source.** After power on, WDAP-2000PE will start to operate.

Note: ONLY use the power adapter supplied with the WDAP-2000PE. Otherwise, the product may be damaged.

2.2 Using PoE (Power over Ethernet)

The LAN port of WDAP-2000PE supports PoE. Before you proceed with the PoE installation, please make sure the PoE adapter or switch is 802.3af compliant.

1. Do not connect the supplied power adapter to the WDAP-2000PE.
2. Connect one end of a standard (category 5) LAN cable to the Ethernet port on the WDAP-2000PE.
3. Connect the other end of the LAN cable to the powered Ethernet port on a suitable PoE Adapter or switch. (IEEE 802.3af compliant)
4. Check the LEDs on the WDAP-2000PE to see it is drawing power via the Ethernet connection.



NOTE: ONLY use the IEEE802.3af complied in-line power equipments to the Access Point. Connect with any other non-standard in-line power device may cause the AP malfunction.

Chapter 3

Setup & Management

3

3.1 Overview

This chapter describes the setup procedure to make the WDAP-2000PE a valid device on your LAN, and to function as an Access Point for your Wireless Stations.

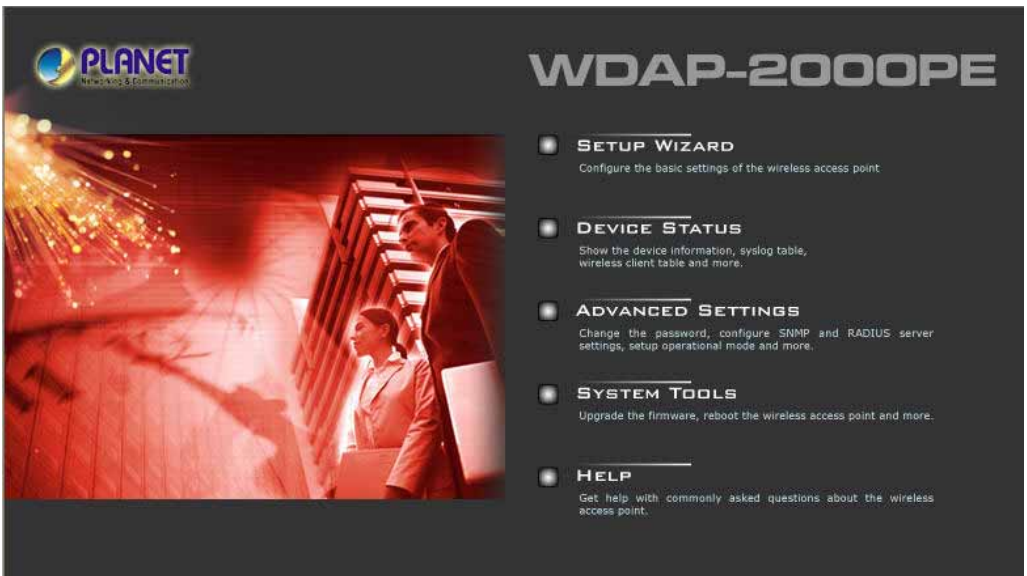
The WDAP-2000PE can be configured using either the Web Browser or the CLI (Command Line Interface). Please refer to appendix B for the commands of CLI.

3.2 Setup using a Web Browser

Web configuration provides a user-friendly graphical interface to manage your WDAP-2000PE. An AP with an assigned IP address (default <http://192.168.1.1>) will allow you to monitor and configure (via web browser e.g., MS Internet Explorer or Netscape).

Before proceeding, please install the WDAP-2000PE in your LAN, as described in chapter 2.

1. Use a PC which is already connected to your LAN, and start the Web browser.
2. In the *Address* box, enter the IP address of the WDAP-2000PE you want to configure. Please also make sure your PC's IP address is in the same IP subnet with WDAP-2000PE.
3. You should see a main configuration screen in the web page as the picture below.



4. If you attempt to access any configuration item, a dialog box will pop up and ask for login password. The default value is "password". The password can and should be changed to avoid unauthorized access. Always enter the current password, as set on the "Advanced Settings" screen.



If you can't connect:

It is likely that your PC's IP address is incompatible with the WDAP-2000PE's IP address. The default IP address of the Wireless Access Point is 192.168.1.1, with a Network Mask of 255.255.255.0.

If your PC's IP address is not compatible with this, you must change your PC's IP address to an unused value in the range 192.168.1.2 ~ 192.168.1.254, with a Network Mask of 255.255.255.0.

3.3 Setup Wizard

The setup wizard helps you to configure the basic settings of WDAP-2000PE in four steps.

3.3.1 Time Settings

The time of WDAP-2000PE is automatically synchronized to the local time of the management PC at the first time a connection is made. To modify the device's time, select desired setting for each field. Click "NEXT" to proceed.

Setup Wizard | Device Status | Advanced Settings | System Tools | Logout

Time Settings

Enable NTP

local time zone
GMT+08:00 (Beijing, Hong Kong, Singapore, Taipei, ...)

local date and time
Jul 06 2005 (HH:MM:SS) 10 : 47 : 09 AM

NEXT


NOTE: Changes to this page will not take effect until you click **FINISH** on the save config page.

Help

| | |
|--------------------------------------|---|
| Enable NTP | You can enable the NTP function and configure the server name/IP-address of the NTP server you want to use. Once NTP is enabled, the system will set its own date/time to the value returned from the NTP server. |
| Local time zone/date and time | Please choose the time zone according to your location and set the date and time. |

3.3.2 Device IP Settings

You can manually configure the IP settings to WDAP-2000PE, or use DHCP client protocol to obtain IP address automatically. Click "NEXT" to proceed.


802.11a+g PoE Access Point

Setup Wizard
Device Status
Advanced Settings
System Tools
Logout

SETUP WIZARD

TIME SETTINGS

DEVICE IP SETTINGS

WIRELESS SETTINGS

SAVE CONFIG

Device IP Settings

You can select one of the following two approaches to assign an IP address to this device.

Assign static IP to this device.

IP Address:


IP Subnet Mask:

Gateway IP Address:

DNS Server:

Use the DHCP client protocol to automatically get the IP address for this device.

NOTE: Changes to this page will not take effect until you click FINISH on the save config page.

 Help

| | |
|--|--|
| Assign static IP to this device | <p>If selected, the following data must be entered.</p> <ul style="list-style-type: none"> IP Address - The IP Address of this device. Enter an unused IP address from the address range on your LAN. Subnet Mask - The Network Mask associated with the IP Address above. Enter the value used by other devices on your LAN. Gateway - The IP Address of your Gateway or Router. Enter the value used by other devices on your LAN. DNS - Enter the DNS (Domain Name Server) used by PCs on your LAN. |
| Use the DHCP protocol to ... | <p>Select this option if you have a DHCP Server on your LAN, and you want the WDAP-2000PE to obtain an IP address automatically.</p> |

3.3.3 Wireless Settings

You can set the SSID, Operating Standard and Channel of 5GHz and 2.4GHz radios, Common Security Policy in this page. Click "NEXT" to proceed.



- SETUP WIZARD
- TIME SETTINGS
- DEVICE IP SETTINGS
- WIRELESS SETTINGS
- SAVE CONFIG

Wireless Settings

Network ID(SSID)

All wireless clients must use the same Network Name (SSID) in order to associate with the same wireless network.

Disable SSID Broadcasting

Regulatory Domain: FCC

WLAN Standard for Radio 1

Mode:

Channel:

WLAN Standard for Radio 2

Mode:

Channel:

Select Common Security Policy:

BACK NEXT

NOTE: To access the wireless network, user must have correct SSID and encryption key, if enabled.



| | |
|--------------------------------------|--|
| Network ID (SSID) | The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. Please make sure that the SSID of all stations in the same WLAN network are the same. The default SSID is "default". |
| Disable SSID Broadcasting | If this option is unselected, every wireless station located within the coverage of this access point can discover this access point easily. Disabling "Broadcast SSID" can provide better security and privacy. |
| Regulatory Domain | Please make sure that your regulatory domain matches your region. |
| WLAN standard for Radio 1 / 2 | <p>Mode: Set the mode for each radio. Radio1 only operates on the 5 GHz frequency and radio2 only operates on the 2.4 GHz frequency. So radio1 can be configured with 11a or Super A, and radio2 can be configured with 11g/b, 11b only, 11g only, and Super G.</p> <p>Channel: Select the appropriate channel for each radio from the list provided to correspond with your network settings. It is suggested to select Auto and let the system pick up the best channel for you.</p> |
| Select Common Security Policy | None: No security is used. Anyone using the correct SSID can connect to your network. |

Security Policy

connect to your network.

WEP: WPA-2000PE allows you to use WEP data encryption to secure your data from being eavesdropped by unauthorized users. There are WEP64, WEP128 and WEP152 provided for data encryption.

You can either use ASCII format or Hex format to enter a key. With Hex format, 2 digits represent 1 byte. Once you enable the WEP function, please make sure that exactly the same WEP keys are set on the Wireless AP as well as on wireless client stations.

Note: Some Wireless Client Card used for Hexadecimal digits only. Please note that when configuring WEP encryption keys, a WEP128 ASCII key looks like "An ASCII key!" (13 characters), while a WEP64 hex key looks like "441224A8B2"(5 characters).

802.1x: Use 802.1x to do authentication and provide encryption (if rekeying is enabled). An external RADIUS server should be setup, and you also need to complete the configurations on "RADIUS Settings" page under "Advanced Settings" tab.

WPA-PSK: Use WPA-PSK to provide security, you need to enter an ASCII key for this mode. Different encryption types can be used: TKIP, CCMP, or both. A group key is used for multi-cast/broadcast data, and the rekey interval is time period that the system will change the group key periodically. The shorter the interval is, the better the security is.

WPA: This version of WPA requires a Radius Server on your LAN to provide the client authentication according to the 802.1x standard. You would also need to complete the configurations on "RADIUS Settings" page under "Advanced Settings" tab. Data transmissions are encrypted using the WPA standard. Different encryption types can be used: TKIP, CCMP, or both. A group key is used for multicast/broadcast data, and the rekey interval is time period that the system will change the group key periodically. The shorter the interval is, the better the security is.

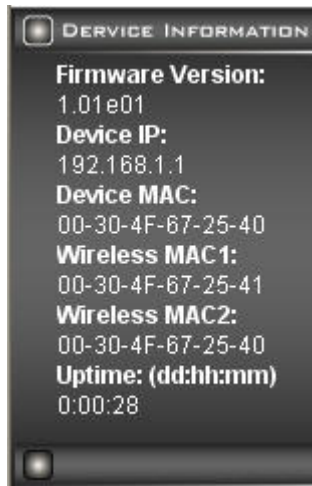
3.3.4 Save Config

After stepping through the Wizard's pages, you can press the "FINISH" button on this page for your modification to take effect. This also makes your new settings saved into the permanent memory on your system.

The screenshot shows the 'Save Config' screen of the Planet 802.11a+g PoE Access Point Setup Wizard. The interface includes a top navigation bar with tabs for 'Setup Wizard', 'Device Status', 'Advanced Settings', 'System Tools', and 'Logout'. On the left, a vertical sidebar contains menu items: 'SETUP WIZARD' (selected), 'TIME SETTINGS', 'DEVICE IP SETTINGS', 'WIRELESS SETTINGS', and 'SAVE CONFIG'. The main content area features a red header with the Planet logo and the text '802.11a+g PoE Access Point'. Below the header, the title 'Save Config' is displayed with a red dot icon. A message states: 'You have completed the setup wizard configuration. Click **FINISH** to save these settings.' At the bottom right, there are two buttons: 'BACK' and 'FINISH'. A 'Help' button with a globe icon is located at the bottom left of the main content area.

3.4 Device Status

You can monitor the system general information from the **Device Information** field.



3.4.1 System Log

The system log allows you to track events that have occurred in the system. Such event messages can sometimes be helpful in determining the cause of a problem that you may have encountered.

The screenshot shows the web interface for a Planet 802.11a+g PoE Access Point. The main navigation bar includes "Setup Wizard", "Device Status", "Advanced Settings", "System Tools", and "Logout". The left sidebar has a "DEVICE STATUS" section with sub-items: "DEVICE STATUS", "SYSTEM LOG", "WIRELESS CLIENT TABLE", and "BRIDGE TABLE". The "SYSTEM LOG" sub-item is selected. The main content area is titled "System Log" and shows a "Log Level" of "3 (err)". The log entries are:

- Jan 1 08:00:10 WDAP-2000PE csp: Link Up on interface [lan]
- Jan 1 08:03:27 WDAP-2000PE http: Login into the system
- Jan 1 08:03:32 WDAP-2000PE http: Logout from the system
- Jan 1 08:13:07 WDAP-2000PE http: Login into the system
- Jan 1 08:27:52 WDAP-2000PE http: Logout from the system
- Jan 1 08:28:47 WDAP-2000PE http: Login into the system

A "Help" button is visible at the bottom of the log area.

3.4.2 Wireless Client Table

The wireless client table lists the current wireless clients and its MAC address, state, and traffic statistics.


802.11a+g PoE Access Point

Setup Wizard
Device Status
Advanced Settings
System Tools
Logout

DEVICE STATUS

SYSTEM LOG

WIRELESS CLIENT TABLE

BRIDGE TABLE

DEVICE INFORMATION

Firmware Version:
1.01e01

Device IP:
192.168.1.1

Device MAC:
00-30-4F-67-25-40


Wireless MAC 1:
00-30-4F-67-25-41

Wireless MAC 2:
00-30-4F-67-25-40

Uptime: (dd:hh:mm)
0:00:29

Wireless Client Table

| Radio Name | MAC Address | State | Tx Pkts | Rx Pkts |
|------------|-------------|-------|---------|---------|
| - | - | - | - | - |

 Help

3.4.3 Bridge Table

The bridge table shows all MAC entries learned from the wired LAN interface, wireless clients, and WDS peers (if running in the WDS mode).


802.11a+g PoE Access Point

Setup Wizard
Device Status
Advanced Settings
System Tools
Logout

DEVICE STATUS

SYSTEM LOG

WIRELESS CLIENT TABLE

BRIDGE TABLE

DEVICE INFORMATION

Firmware Version:
1.01e01

Device IP:
192.168.1.1

Device MAC:
00-30-4F-67-25-40


Wireless MAC 1:
00-30-4F-67-25-41

Wireless MAC 2:
00-30-4F-67-25-40

Uptime: (dd:hh:mm)
0:00:29

Bridge Table

| MAC Address | Interface |
|-------------------|------------------|
| 00-30-4F-67-25-40 | wlan1-bss(local) |
| 00-30-4F-67-25-40 | eth0(local) |
| 00-30-4F-67-25-41 | wlan0-bss(local) |
| 00-30-4F-26-b3-35 | eth0 |

 Help

3.4.4 Radio Table

Radio table lists current Mode, channel, client associated with them and transmit packet, received packet, data error.

The screenshot shows the Planet 802.11a+g PoE Access Point web interface. The top navigation bar includes "Setup Wizard", "Device Status", "Advanced Settings", "System Tools", and "Logout". The left sidebar contains a menu with "DEVICE STATUS" selected, and "DEVICE INFORMATION" expanded to show "Firmware Version: 1.01e04" and "Device IP: 192.168.1.1". The main content area is titled "Radio Table" and contains a table with the following data:

| Radio Name | Mode | Op Channel | Assoc. Clients | Tx Pkts | Rx Pkts | Error |
|------------|------|------------|----------------|---------|---------|-------|
| radio1 | a | 165 | 0 | 0 | 0 | 151 |
| radio2 | b/g | 7 | 0 | 1407 | 3731 | 6464 |

Below the table is a "Help" button.

3.4.5 Site Survey Table

This page shows other APs currently in the environment that the system can detect.

The screenshot shows the Planet 802.11a+g PoE Access Point web interface. The top navigation bar includes "Setup Wizard", "Device Status", "Advanced Settings", "System Tools", and "Logout". The left sidebar contains a menu with "SITE SURVEY TABLE" selected, and "DEVICE INFORMATION" expanded to show "Firmware Version: 1.01e05" and "Device IP: 192.168.1.1". The main content area is titled "Site Survey Table" and contains a table with the following data:

| ESSID | MAC Address | Mode | Channel | Signal strength |
|----------------|-------------------|------|---------|-----------------|
| GUEST_WIRELESS | 00:c0:02:19:b3:4f | g | 13 | 46% |
| WAP | 00:c0:02:19:b3:4e | g | 13 | 40% |
| WWR2000 | 00:0b:8b:35:39:0d | g | 1 | 59% |

Below the table are "Help" and "REFRESH" buttons.

3.5 Advanced Settings

The advanced settings tab contains more configurations for experienced users. However, changing your login password from the default factory setting is highly recommended for security purposes.

3.5.1 Password Settings

The default administrative password is “**password**”. To change the password, type the current password followed by the new password twice. The entered characters will appear as asterisks. Click “APPLY” to save the new setting.



The screenshot displays the web interface for a Planet 802.11a+g PoE Access Point. The top navigation bar includes tabs for Setup Wizard, Device Status, Advanced Settings (selected), System Tools, and Logout. A left sidebar lists various configuration categories, with Password Settings highlighted. The main content area is titled "Password Settings" and "Change Password". It provides instructions: "To change your administrative password, enter your current password and then the new password twice." Below this, there are three input fields labeled "Current Password:", "New Password:", and "Re-enter New Password:". An "APPLY" button is located at the bottom right, and a "Help" button is at the bottom left.

3.5.2 System Management

Clicking the **System Management** button to configure system related parameters.

System Management

Local Management

Disable management from wireless client

System Administration

HTTP Port No.: timeout: minutes

UPnP

Enable UPnP

Bridge

Enable STP

Syslog

Enable Syslog

Syslog server IP address: . . .

Email Log

Enable Email Log

Mail Server:

Email Address:

APPLY

NOTE: Syslog is a standard for logging system events (IETF RFC-3164). System event messages generated by the wireless access point will be sent to a Syslog daemon running on a server identified by this IP address.

| | |
|------------------------------|---|
| Local Management | This option allows you to enable/disable management from WLAN connection. |
| System Administration | The Access Point allows you to designate special port numbers other than the standard 80 for http for remote management. It also allows you to specify the duration of idle time (inactivity) before a web browser session times out. The default time-out value is 10 minutes. |
| UPnP | The Universal Plug and Play (UPnP) feature allows a Windows XP/ME PC to discover this WDAP-2000PE and automatically show an icon on the screen. Then a user can double-click the icon to access this device directly (without having to find out its IP address). |

| | |
|------------------|--|
| Bridge | You can enable/disable the 802.1d STP (Spanning Tree Protocol) function on the bridge of WLAN and Ethernet (i.e. the LAN interface). Enable this function can detect loops in your LAN environment and then protect the LAN from being saturated with infinite loop traffic. |
| Syslog | When the WDAP-2000PE encounters an error or warning condition (e.g., a log-in attempt with an invalid password), it will create a log in the system log table. Enabling Syslog option, the WDAP-2000PE will send logged events over network to the specified server for remote storage and future reviewing. |
| Email Log | If you check the "Enable Email Log" button, the WDAP-2000PE will send log information to the configured email address through the configured mail server. |

3.5.3 SNMP Settings

SNMP Settings

Enable SNMP

Assign system information:

System Name:

System Location:

System Contact:

Assign the SNMP community string:

Community String For Read:

Community String For Write:

APPLY

Assign a specific name and IP address for your SNMP trap manager:

Name:

IP Address: . . .

ADD

| Select | Name | IP Address | Enable |
|--------|------|------------|--------|
| - | - | - | - |

DELETE SELECTED

| | |
|--------------------|---|
| Enable SNMP | SNMP enables network administrators to manage network performance, find and solve network problems. When SNMP feature |
|--------------------|---|

| | |
|--|---|
| | are enabled, the device can send out TRAP messages automatically to the TRAP manager if configured. |
| Assign System Information | <p>System Name: A name that you assign to your WDAP-2000PE. It is an alphanumeric string of up to 30 characters.</p> <p>System Location: Description of where your WDAP-2000PE is physically located. It is an alphanumeric string of up to 60 characters.</p> <p>System Contact: Contact information for the system administrator responsible for managing your WDAP-2000PE. It is an alphanumeric string of up to 60 characters.</p> |
| Assign the SNMP Community String | <p>Community String For Read: If you intend the access point to be managed from a remote SNMP management station, you need to configure a read-only “community string” for readonly operation. The community string is an alphanumeric string of up to 15 characters.</p> <p>Community String For Write: For read-write operation, you need to configure a write “community string”.</p> |
| Assign a specific name and IP address ... | <p>A trap manager is a remote SNMP management station where special SNMP trap messages are generated (by the Access Point) and sent to in the network. You can define trap managers in the WDAP-2000PE.</p> <p>You can add a trap manager by entering a name, an IP address, followed by pressing the ADD button.</p> <p>You can delete a trap manager by selecting the corresponding entry and press the DELETE SELECTED button.</p> <p>You can enable a trap manager by checking the Enable box in the corresponding entry or disable the trap manager by unchecking the Enable box.</p> |

3.5.4 MAC Filtering Settings

The WDAP-2000PE allows you to define a list of MAC addresses that are allowed or denied to access the wireless network.

MAC Filtering Settings

This feature allows you to define a list of MAC addresses that are authorized to access or denied from accessing the wireless network.

- Disable MAC address control list**
No MAC address filtering is performed.
- Enable GRANT address control list**
Allow data traffic from devices listed in the table to access the network.
- Enable DENY address control list**
Deny/discard data traffic from devices listed in the table.

APPLY

Mnemonic Name:

MAC Address:

| | | | | | | | | | | | | |
|----|---|----|---|----|---|----|---|----|---|----|---|----|
| 00 | - | 00 | - | 00 | - | 00 | - | 00 | - | 00 | - | 00 |
|----|---|----|---|----|---|----|---|----|---|----|---|----|

ADD

| Select | Name | MAC Address(es) |
|--------|------|-----------------|
| - | - | - |

DELETE SELECTED

NOTE: Incorrect configuration may cause undesirable behavior. Please refer to the user manual for more details

| | |
|--|--|
| Disable MAC address control list | When selected, no MAC address filtering will be performed. |
| Enable GRANT address control list | When selected, data traffic from only the specified devices in the table will be allowed in the network. |
| Enable DENY address control list | When selected, data traffic from the devices specified in the table will be denied/discarded by the network. |

To add a MAC address into the table, enter a mnemonic name and the MAC address, and click **ADD**.

The table lists all configured MAC Filter entries. To delete entries, check the corresponding **select** boxes and then press **DELETE SELECTED**.

3.5.5 SSID Settings

The WDAP-2000PE allows you to configure multiple SSID's and corresponding QoS settings if QoS is enabled.

SSID Settings

- Enable VLAN for all SSIDs
- Enable QoS
- Enable DiffServ Marking

APPLY

| SSID Name | VLAN ID/Priority | Security |
|-------------------------------|------------------|-------------|
| <input type="radio"/> default | 0 / 0 | No Security |

NEW

DELETE SELECTED

SET AS PRIMARY

SSID Name:

VLAN ID:

802.1p priority: ▼

DSCP value: (Binary format. eg:001001)

Select Security Policy: ▼

APPLY

| | |
|---|--|
| Enable VLAN for all SSIDs | Once this function is enabled, you can specify an individual VLAN ID and priority tag for each SSID. In this way, you can separate traffic from stations using different SSIDs and so protect the wired network from being accessed by unauthorized stations using certain SSIDs. If this function is enabled, packets from a SSID will be forwarded to the Ethernet with the corresponding configured VLAN tag. |
| Enable QoS | Enable QoS function allows you to assign a priority for each SSID. Then the traffic to/from a WLAN station will have a priority set for the SSID the station is using. If the VLAN function is enabled, the priority is given by the 802.1p priority configured. Otherwise, the priority is set by choosing one of the four service levels. |
| Enable DiffServ Marking | When this function is enabled, you can configure a DSCP value for each SSID. Then a packet from a station using this SSID to get associated will be forwarded with the DSCP value labeled. |
| NEW, DELETE SELECTED, SET AS PRIMARY | These buttons allow you to CLEAR the content of the SSID configuration items currently displayed, DELETE the selected SSID entry, and SET the selected SSID to be the primary SSID. |
| SSID name | The string of SSID. |
| VLAN ID | The VLAN ID for this SSID. This item is available only when the VLAN function is enabled. |
| 802.1p priority | The 802.1p priority for this SSID. This item is available only when the VLAN function is enabled. |
| DSCP value | The DSCP value (a 6-bit pattern) for this SSID when the DiffServ Marking function is enabled. |

Select security policy

Configure the security policy for the SSID.

3.5.6 Wireless Settings

Wireless Settings

Beacon Interval : (msec. range: 20-1000, default 100)

RTS Threshold : (range: 1-2347, default 2347)

Fragmentation : (range: 256-2346, default 2346)

DTIM Interval : (range: 1-255, default 1)

User Limitation: (range: 1-100, default 100)

Enable privacy separator

Enable Radio 1

Radio 1 Transmit Power :

Enable Radio 2

Radio 2 Transmit Power :

Rate Control: Rate at Mbps

Age Out Timer : (sec. range: 10-65535, default 300)

AckTimeOut (11a): (range: 10-255, default 25)

AckTimeOut (11g): (range: 10-255, default 48)

AckTimeOut (Turbo): (range: 10-255, default 22)

DEFAULT

APPLY

Beacon interval


The WPA2-2009PE broadcasts beacon frames regularly to announce its existence. Default is 100, i.e., ten beacons per second. Decreasing the beacon interval makes passive scanning more reliable and faster. Increasing the beacon interval may improve throughput by decreasing contention for the medium.

RTS threshold

RTS/CTS frames are used to gain control of the medium for transmission. If there are heavy traffic from many stations, decrease RTS threshold will reduce collision. The RTS threshold should have a value between 256-2347 bytes, with a default of **2347**. It is recommended that this value does not deviate from the default too much.

| | |
|---------------------------------------|---|
| Fragmentation | When the size of a unicast frame exceeds the fragmentation threshold, it will be fragmented before the transmission. It should have a value of 256-2346 bytes, with a default of 2346 . If you experience a high packet error rate, you should slightly decrease the Fragmentation Threshold. |
| DTIM interval | The WDAP-2000PE buffers packets for stations that operate in the power saving mode. The Delivery Traffic Indication Message (DTIM) informs such power conserving stations that there are packets waiting to be received by them. The DTIM interval specifies how often the beacon frame should contain DTIMs. It should have a value between 1 to 255, with a default value of 1. |
| User limitation | Set the number of users allowed to get associated with your WDAP-2000PE. |
| Enable privacy seperator | Enable Privacy Separator will make any two WLAN stations on different networks unable to see each other. |
| Radio 1/Radio 2 Transmit Power | This is the power degree in percentage (max.: 100%) that radio1/radio2 uses to transmit data. |
| Rate control | This is the maximum or fixed data rate to transmit data supported. |
| Age out timer | If a station does not send anything in age out time, a empty date frame will be sent to the station, If this frame is not ACKed, the station will be disassociated and then deauthenticated. |

3.5.7 Operational Mode

 **Operational Mode**

Select a Radio to configure:

Radio1
 Radio2

select the operational mode:

Access Point

 Wireless Distribution System(Bridge Mode)

Additional configurations for WDS mode:

Peer Name:

MAC Address: -----

| Select | Peer Name | MAC Address |
|-----------------------|-----------|-------------------|
| <input type="radio"/> | aaa | 22-55-55-55-55-55 |

| | |
|----------------------------------|---|
| Select a Radio to config- | Currently, each radio of the WDAP-2000PE can be configured to operate in AP or WDS mode. When configured as a WDS, you need to further configure the name and MAC address of its peer |
|----------------------------------|---|

| | |
|---|--|
| ure | WDS devices. |
| Access Point | This means the device is working on AP-only Mode, and is for wireless client users only. |
| Wireless Distribution System (Bridge mode) | This mode can help you to group different wired networks together by multiple WDAP-2000PE. The single system can support up to 8 WDAP-2000PE in WDS mode. |
| Additional configurations for WDS mode | <p>If the device is working on 'Wireless Distribution System (Bridge Mode)', you must add the MAC addresses of the grouped WDAP-2000PE to the table.</p> <p>Peer name: Alias to help you recognize another WDS station.</p> <p>MAC address: The MAC address of other WDS AP you want to add into this group.</p> |

3.5.8 RADIUS Settings

The Radius server can be used for 802.1x EAP authentication. IEEE 802.1x is an IEEE standard that is based on a framework that involves stations to be authenticated (called Supplicant), an authentication server (a Radius Server) that provides authentication services, and an authenticator that provides necessary translation and mediating functions between the authentication server and the stations to be authenticated. The WDAP-2000PE acts as an authenticator, and it relays authentication messages between the RADIUS server and client devices being authenticated.

IEEE 802.1x EAP authentication is enabled by selecting the **Security Policy** as **802.1x** or **WPA**, and this selection is in the **Wireless Settings** under **Setup Wizard**.

Radius Settings

Primary Server

Enable Primary Server

Server IP: . . .

Port Number:

Radius Type: RADIUS

Shared Secret:

Secondary Server

Enable Secondary Server

Server IP: . . .

Port Number:

Radius Type: RADIUS

Shared Secret:

RADIUS Server Retry Times Times

APPLY

| | |
|--|---|
| Enable Primary/Secondary Server | Check this if you want to enable RADIUS authentication using the primary/secondary Radius Server. If both are selected, the primary server will be tried first. |
| Server IP | The IP address of the RADIUS server. |
| Port number | The port number that your RADIUS server uses for authentication. The default setting is 1812. |
| Shared secret | This is used by your RADIUS server in the Shared Secret field in Radius protocol messages. The shared secret configured in the WDAP-2000PE and the RADIUS server must be identical. The shared secret can contain up to 64 alphanumeric characters. |
| Retry times | The number of times the WDAP-2000PE should attempt to contact the primary server before giving up. |

3.5.9 DoS Settings

A Denial of Service attack is one of the popular hacking methods. The attacker tries to make some resource too busy to answer legitimate requests, or to deny legitimate users access to your machine. WDAP-2000PE can be configured to prevent such attack.

DoS Prevention Settings

Authentication fails times

Broadcast storm filtering

Ping flooding filtering

APPLY

Authentication Failure Clients

| Select | MAC Address | SSID Name |
|--------|-------------|-----------|
| - | - | - |

DELETE SELECTED

Help

| | |
|----------------------------------|--|
| Authentication fails | You can set a maximum failure count. When the number of times that a WLAN station fails to authenticate itself reaches this count, the station (identified by its MAC address) will be put into a rejectee list. So the station will not be even authenticated any more. Once a station is put into the rejectee list, you can remove it from the table at the bottom of this page. |
| Broadcast storm filtering | When the broadcast traffic reaches the configured degree (e.g. High, Low), any more broadcast packets will be dropped. Higher degree allows less broadcast traffic pass through. |

Ping flooding filtering

When the ping (to the AP) traffic reaches the configured degree (e.g. High, Low), any more such ping packets will be dropped. Higher degree allows less ping traffic to the AP.

3.6 System Tools

3.6.1 Firmware Upgrade

You can upgrade the firmware of your WDAP-2000PE. Normally, this is done when a new version of firmware is released.



Upgrade procedures:

Step 1: Select **System Tools**→ **Firmware Upgrade** from the menu.

Step 2: To update the WDAP-2000PE firmware, first download the firmware from the distributor's web site to your local disk, and then from the above screen enter the path and filename of the firmware file (or click **Browse** to locate the firmware file). Next, Click the **Upgrade** button to start.

The new firmware will begin being loaded to your WDAP-2000PE. After a message appears telling you that the operation is completed, you need to reset the system to have the new firmware take effect.

3.6.2 Configuration Save and Restore

You can save system configuration settings to a file, and later download it back to the WDAP-2000PE by following the steps below.



The screenshot shows the web interface for a Planet 802.11a+g PoE Access Point. The top navigation bar includes tabs for Setup Wizard, Device Status, Advanced Settings, System Tools, and Logout. The System Tools menu is expanded on the left, showing options like SYSTEM TOOLS, FIRMWARE UPGRADE, CONFIGURATION SAVE AND RESTORE, FACTORY DEFAULT, and REBOOT SYSTEM. The main content area is titled "Configuration Save and Restore" and contains the following instructions and controls:

- Click **SAVE TO FILE** to save your configuration to a management host.
- Select the text configure file by clicking **Browse**, then click **RESTORE FROM FILE**.
- A text input field for the file path is provided, with a "浏览..." (Browse) button next to it.
- A **RESTORE FROM FILE** button is located below the input field.
- A **NOTE** states: "Some browsers would fail to locate the configuration file when there is any localized character in the configuration file path."
- A **Help** button is located at the bottom left of the main content area.

Step 1: Select **Configuration Save and Restore** from the **System Tools** menu.

Step 2: Enter the path of the configuration file to save-to/restore-from (or click the **Browse** button to locate the configuration file). Then click the **SAVE TO FILE** button to save the current configuration into the specified file, or click the **RESTORE FROM FILE** button to restore the system configuration from the specified file.

3.6.3 Factory Default

You can reset the configuration of your WDAP-2000PE to the factory default settings.



Step 1: Select **Factory Default** from the **System Tools** menu.

Step 2: Click **YES** to go ahead and restore the configuration to the factory default.

3.6.4 Reboot System

You can reset your WDAP-2000PE from the Browser.



Step 1: Select **Reboot System** from the **System Tools** menu.

Step 2: Click **YES** to reboot the WDAP-2000PE.

Chapter 4

PC and Server Configuration

4

4.1 Overview

All Wireless Stations need to have settings which match the Wireless Access Point. These settings depend on the mode in which the WDAP-2000PE is being used.

- If using WEP or WPA-PSK, it is only necessary to ensure that each Wireless station's settings match those of the WDAP-2000PE, as described below.
- For WPA and 802.1x modes, configuration is much more complex. The Radius Server must be configured correctly, and setup of each Wireless station is also more complex.

4.2 Using WEP

For each of the following items, each Wireless Station must have the same settings as the WDAP-2000PE.

| | |
|--------------------------|---|
| Mode | On each PC, the mode must be set to <i>Infrastructure</i> . |
| SSID (ESSID) | This must match the value used on the WDAP-2000PE. The default value is default Note: The SSID is case sensitive. |
| Wireless Security | <ul style="list-style-type: none">• Each Wireless station must be set to use WEP data encryption.• The Key size (64 bit, 128 bit, 152 bit) must be set to match the WDAP-2000PE.• The keys values on the PC must match the key values on the WDAP-2000PE. Note: On some systems, the key sizes may be shown as 40bit, 104bit, and 128bit instead of 64 bit, 128 bit and 152bit. This difference arises because the key input by the user is 24 bits less than the key size used for encryption. |

4.3 Using WPA-PSK

For each of the following items, each Wireless Station must have the same settings as the WDAP-2000PE.

| | |
|---------------------|---|
| Mode | On each PC, the mode must be set to <i>Infrastructure</i> . |
| SSID (ESSID) | This must match the value used on the WDAP-2000PE. The default value is default Note: The SSID is case sensitive. |
| Wireless | On each client, Wireless security must be set to WPA-PSK. |

| | |
|-----------------|---|
| Security | <ul style="list-style-type: none"> • The Pre-shared Key entered on the WDAP-2000PE must also be entered on each Wireless client. • The Encryption method (e.g. TKIP, AES) must be set to match the WDAP-2000PE. |
|-----------------|---|

4.4 Using WPA

This is the most secure and most complex system.

WPA mode provides greater security and centralized management, but it is more complex to configure.

Wireless Station Configuration

For each of the following items, each Wireless Station must have the same settings as the WDAP-2000PE.

| | |
|------------------------------|---|
| Mode | On each PC, the mode must be set to Infrastructure . |
| SSID (ESSID) | <p>This must match the value used on the WDAP-2000PE.</p> <p>The default value is default</p> <p>Note: The SSID is case sensitive.</p> |
| 802.1x Authentication | Each client must obtain a Certificate which is used for authentication for the Radius Server. |
| 802.1x Encryption | <p>Typically, EAP-TLS is used. This is a dynamic key system, so keys do NOT have to be entered on each Wireless station.</p> <p>However, you can also use a static WEP key (EAP-MD5); the WDAP-2000PE supports both methods simultaneously.</p> |

Radius Server Configuration

If using **WPA** mode, the Radius Server on your network must be configured as follow:

- It must provide and accept **Certificates** for user authentication.
- There must be a **Client Login** for the WDAP-2000PE itself.
- The WDAP-2000PE will use its Default Name as its Client Login name.
- The *Shared Key*, set on the *Security* Screen of the WDAP-2000PE, must match the *Shared Secret* value on the Radius Server.
- **Encryption** settings must be correct.

4.5 WPA / 802.1x Server Setup (Windows 2000 Server)

This section describes using *Microsoft Internet Authentication Server* as the Radius Server, since it is the most common Radius Server available that supports the EAP-TLS authentication method.

The following services on the Windows 2000 Domain Controller (PDC) are also required:

- dhcpcd
- dns

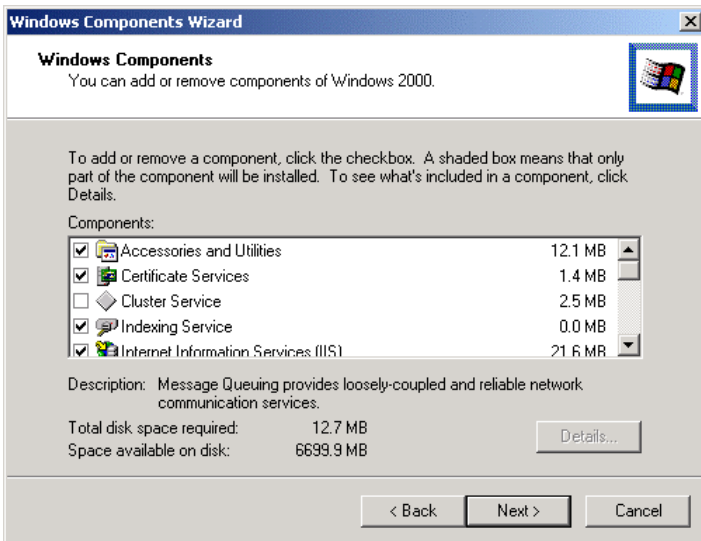
- rras
- webserver (IIS)
- Radius Server (Internet Authentication Service)
- Certificate Authority

4.5.1 Windows 2000 Domain Controller Setup

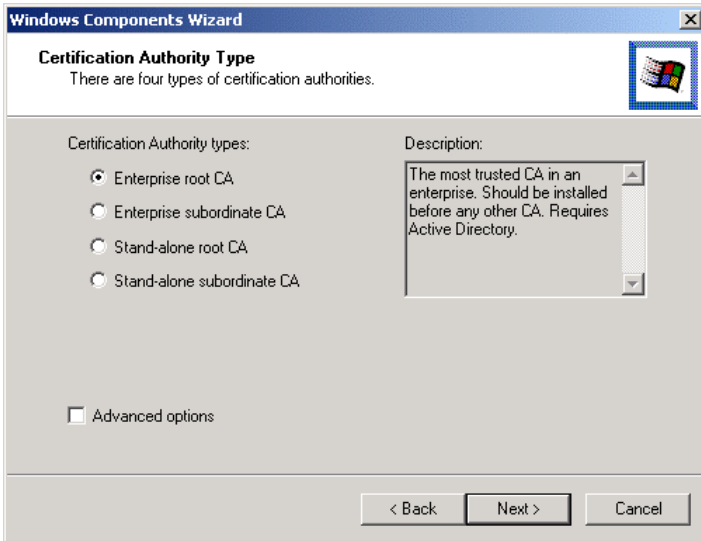
1. Run *dcpromo.exe* from the command prompt.
2. Follow all of the default prompts, ensure that DNS is installed and enabled during installation.

4.5.2 Services Installation

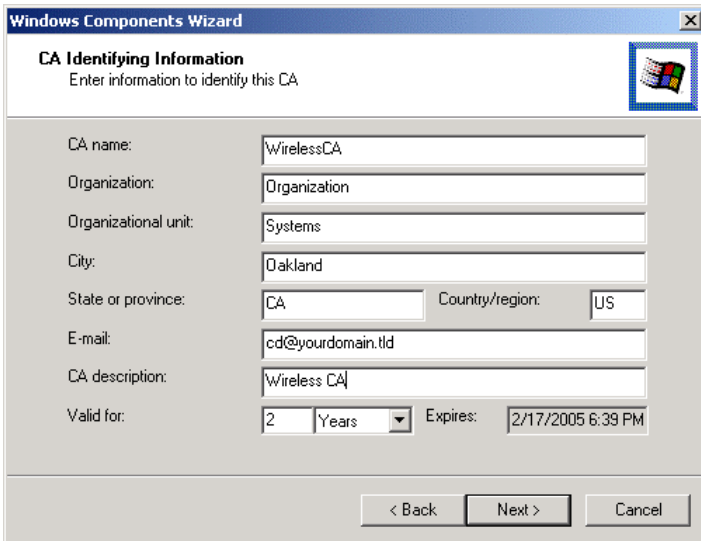
1. Select the *Control Panel - Add/Remove Programs*.
2. Click *Add/Remove Windows Components* from the left side.
3. Ensure that the following components are activated (selected):
 - *Certificate Services*. After enabling this, you will see a warning that the computer cannot be renamed and joined after installing certificate services. Select *Yes* to select certificate services and continue
 - *World Wide Web Server*. Select *World Wide Web Server* on the *Internet Information Services (IIS)* component.
 - From the *Networking Services* category, select *Dynamic Host Configuration Protocol (DHCP)*, and *Internet Authentication Service (DNS should already be selected and installed)*.



4. Click *Next*.
5. Select the *Enterprise root CA*, and click *Next*.



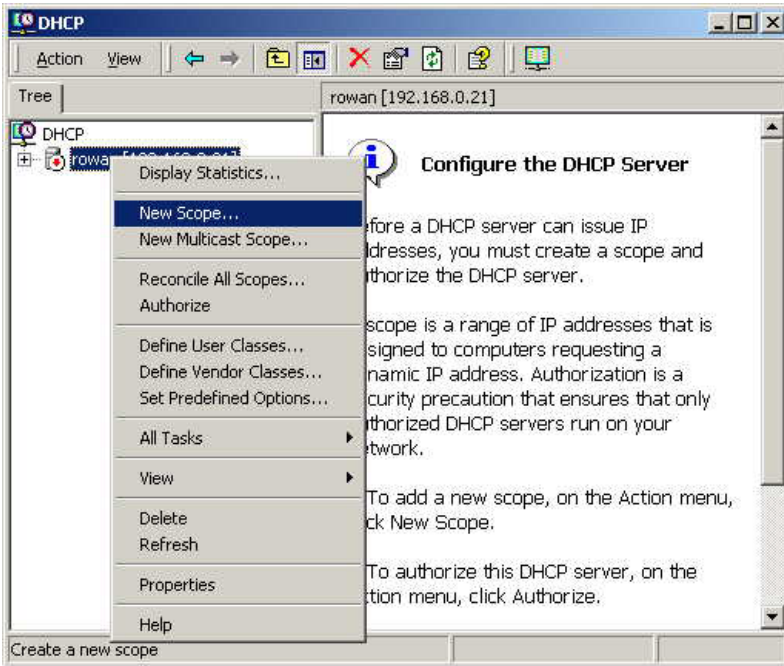
6. Enter the information for the Certificate Authority, and click *Next*.



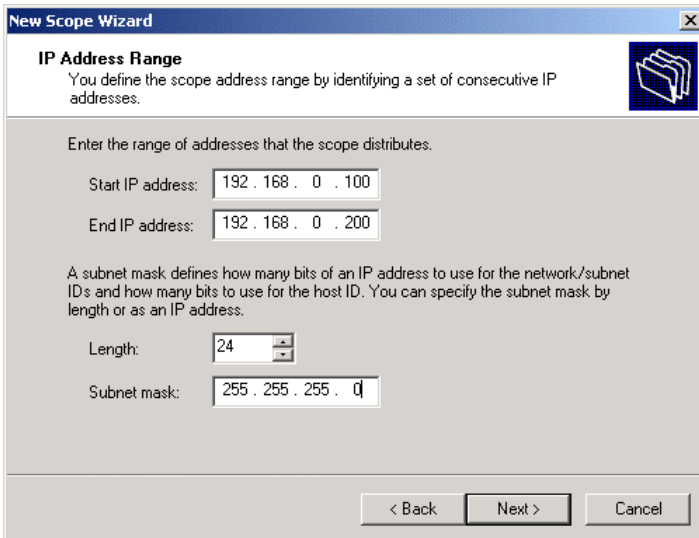
7. Click *Next* if you don't want to change the CA's configuration data.
8. Installation will warn you that Internet Information Services are running, and must be stopped before continuing. Click *Ok*, then *Finish*.

4.5.3 DHCP server configuration

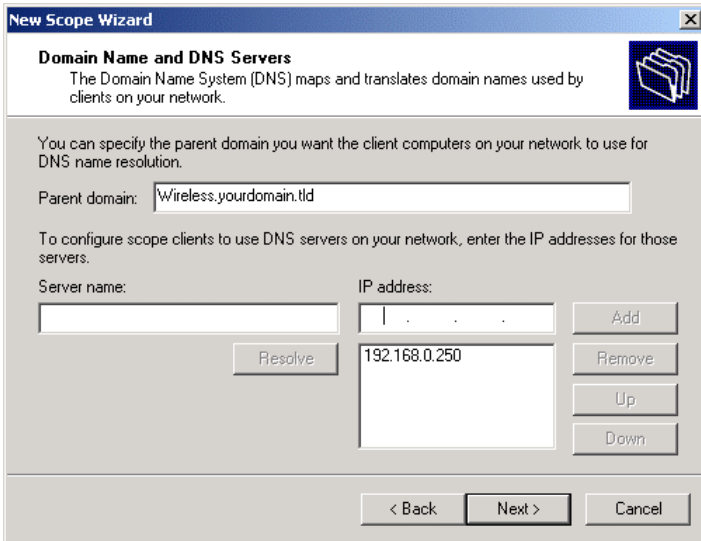
1. Click on the *Start - Programs - Administrative Tools - DHCP*
2. Right-click on the server entry as shown, and select *New Scope*.



3. Click *Next* when the New Scope Wizard Begins.
4. Enter the name and description for the scope, click *Next*.
5. Define the IP address range. Change the subnet mask if necessary. Click *Next*.



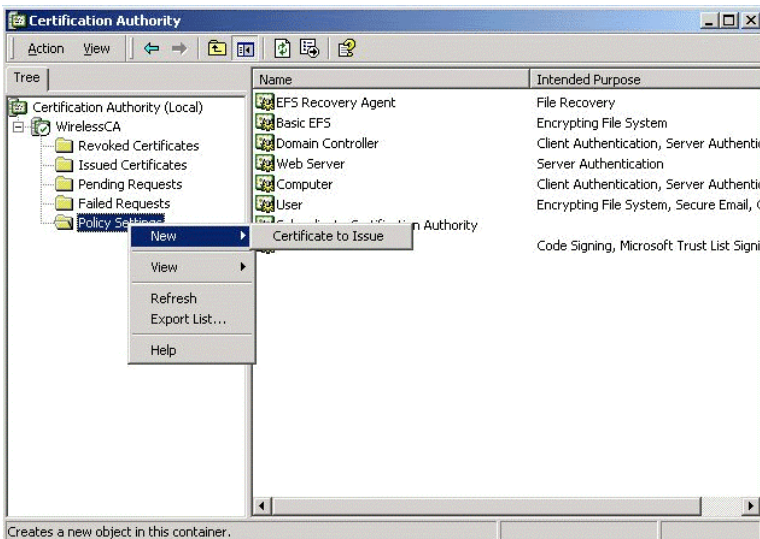
6. Add exclusions in the address fields if required. If no exclusions are required, leave it blank. Click *Next*.
7. Change the *Lease Duration* time if preferred. Click *Next*.
8. Select *Yes, I want to configure these options now*, and click *Next*.
9. Enter the router address for the current subnet. The router address may be left blank if there is no router. Click *Next*.
10. For the Parent domain, enter the domain you specified for the domain controller setup, and enter the server's address for the IP address. Click *Next*.



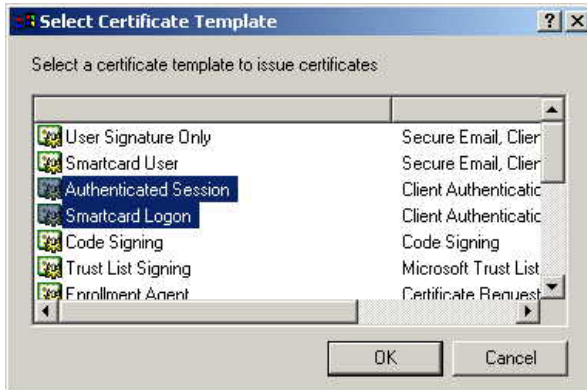
11. If you don't want a WINS server, just click *Next*.
12. Select *Yes, I want to activate this scope now*. Click *Next*, then *Finish*.
13. Right-click on the server, and select *Authorize*. It may take a few minutes to complete.

4.5.4 Certificate Authority Setup

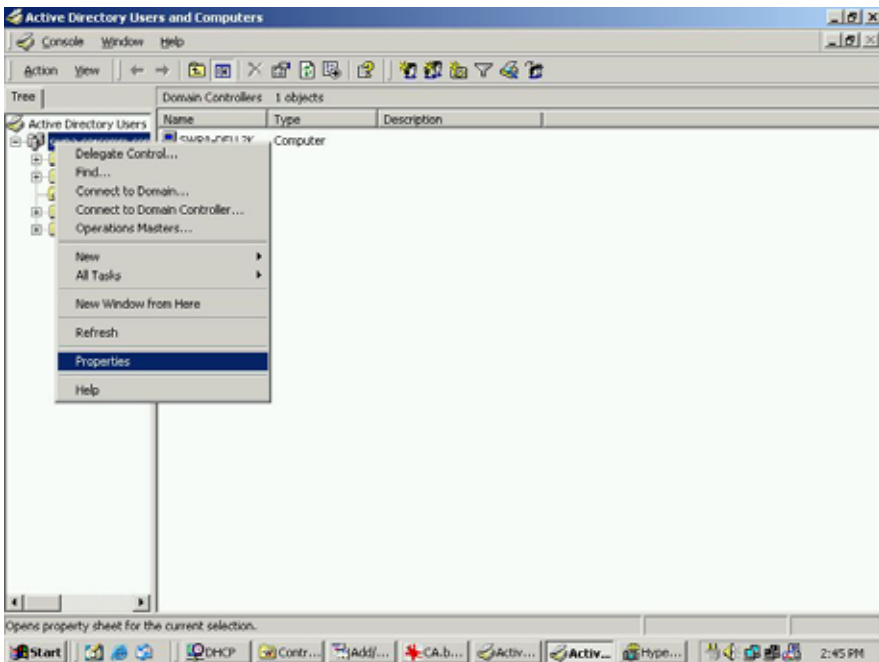
1. Select *Start - Programs - Administrative Tools - Certification Authority*.
2. Right-click *Policy Settings*, and select *New - Certificate to Issue*.



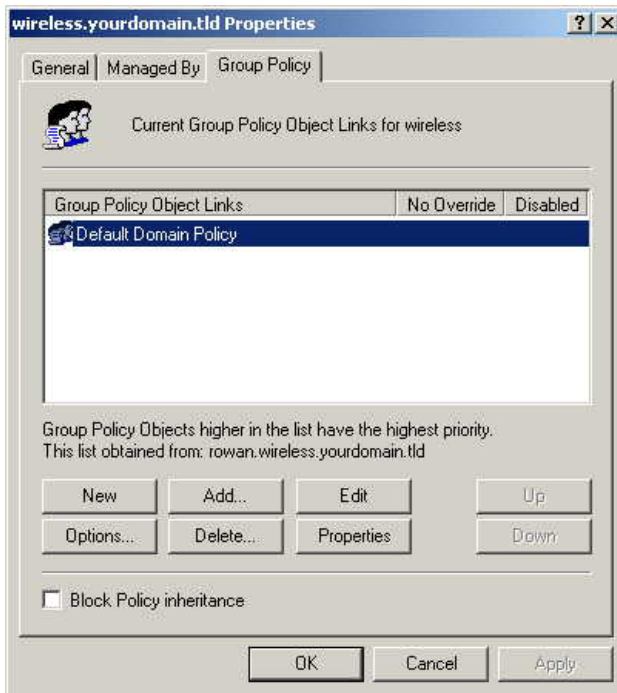
3. Select *Authenticated Session* and *Smartcard Logon* (select more than one by holding down the Ctrl key). Click *OK*.



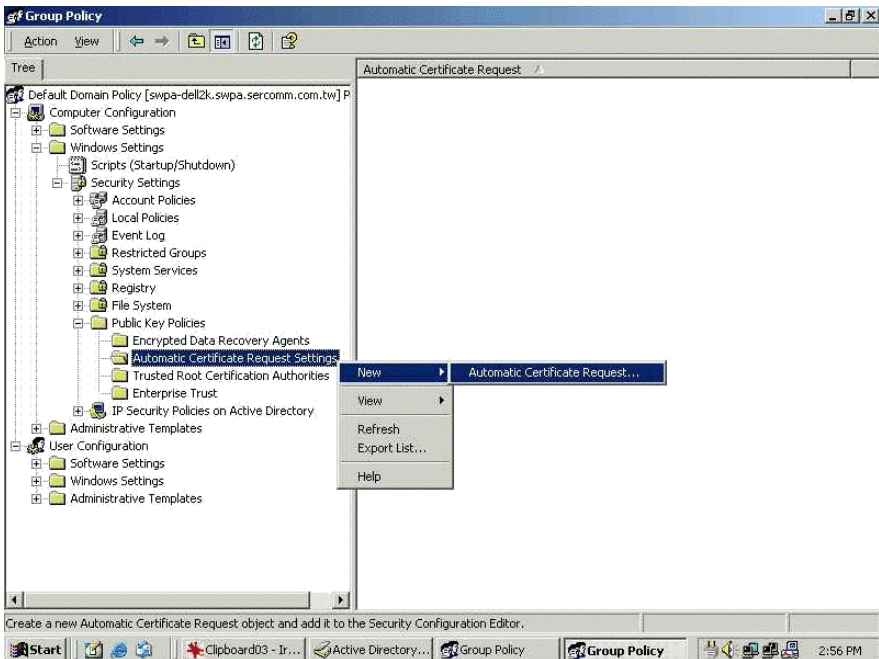
4. Select *Start - Programs - Administrative Tools - Active Directory Users and Computers*.
5. Right-click on your active directory domain, and select *Properties*.



6. Select the *Group Policy* tab, choose *Default Domain Policy* then click *Edit*.



7. Select *Computer Configuration - Windows Settings - Security Settings - Public Key Policies*, right-click *Automatic Certificate Request Settings - New - Automatic Certificate Request*.



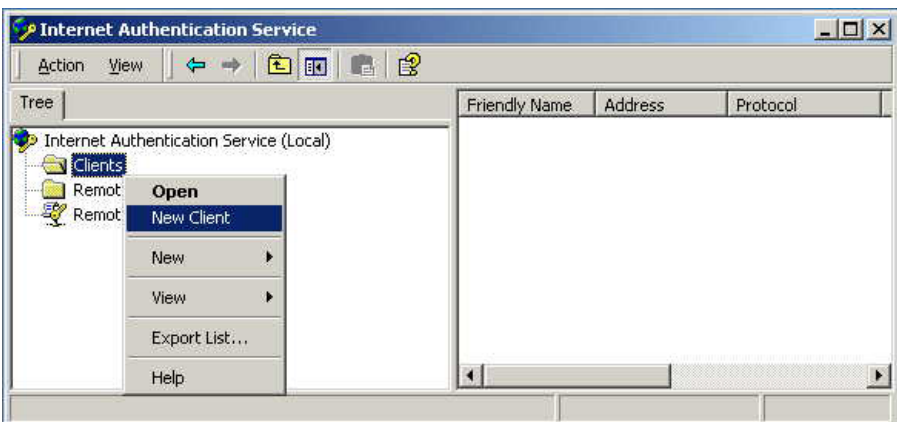
8. When the Certificate Request Wizard appears, click *Next*.
9. Select *Computer*, then click *Next*.



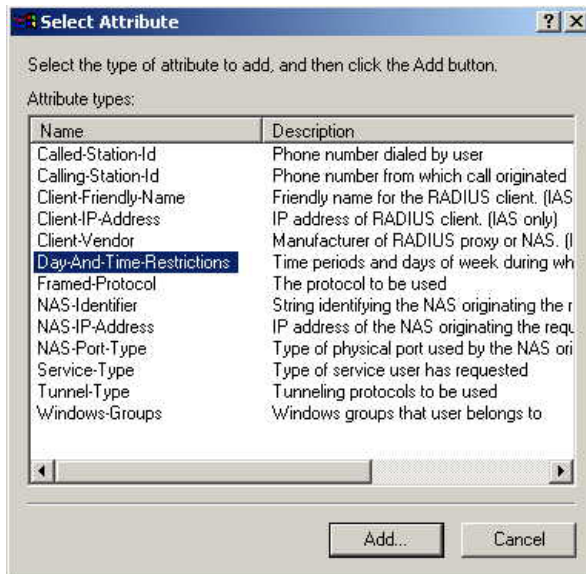
10. Ensure that your certificate authority is checked, then click *Next*.
11. Review the policy change information and click *Finish*.
12. Click *Start - Run*, type *cmd* and press enter.
Enter *secdit /refreshpolicy machine_policy*
This command may take a few minutes to take effect.

4.5.5 Internet Authentication Service (Radius) Setup

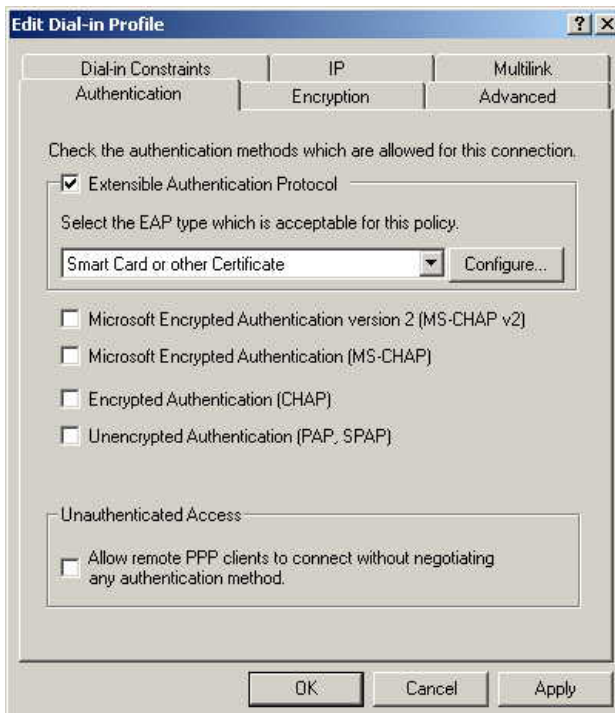
1. Select *Start - Programs - Administrative Tools - Internet Authentication Service*
2. Right-click on *Clients*, and select *New Client*.



3. Enter a name for the access point, click *Next*.
4. Enter the IP address of the WAP-2000PE, and set the shared secret, as entered on the Security Profile screen of the WAP-2000PE.
5. Click *Finish*.
6. Right-click on *Remote Access Policies*, select *New Remote Access Policy*.
7. Assuming you are using EAP-TLS, name the policy *eap-tls*, and click *Next*.
8. Click *Add...*
If you don't want to set any restrictions and a condition is required, select *Day-And-Time-Restrictions*, and click *Add...*



9. Click *Permitted*, then *OK*. Select *Next*.
10. Select *Grant remote access permission*. Click *Next*.
11. Click *Edit Profile...* and select the *Authentication* tab. Enable *Extensible Authentication Protocol*, and select *Smart Card or other Certificate*. Deselect other authentication methods listed. Click *OK*.

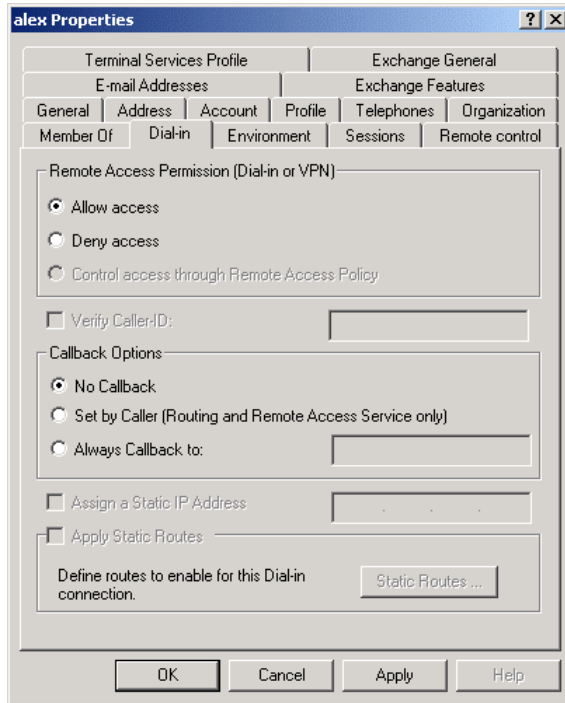


12. Select *No* if you don't want to view the help for EAP. Click *Finish*.

4.5.6 Grant Remote Access for Users

1. Select *Start - Programs - Administrative Tools- Active Directory Users and Computers*.
2. Double click on the user who you want to enable.

3. Select the *Dial-in* tab, and enable *Allow access*. Click *OK*.



4.6 802.1x Client Setup on Windows XP

Windows XP ships with a complete 802.1x client implementation. If using Windows 2000, you can install SP4 (Service Pack 4) to gain the same functionality.

If you don't have either of these systems, you must use the 802.1x client software provided with your wireless adapter. Refer to the documentation of your wireless adapter for setup instructions.

The following instructions assume that:

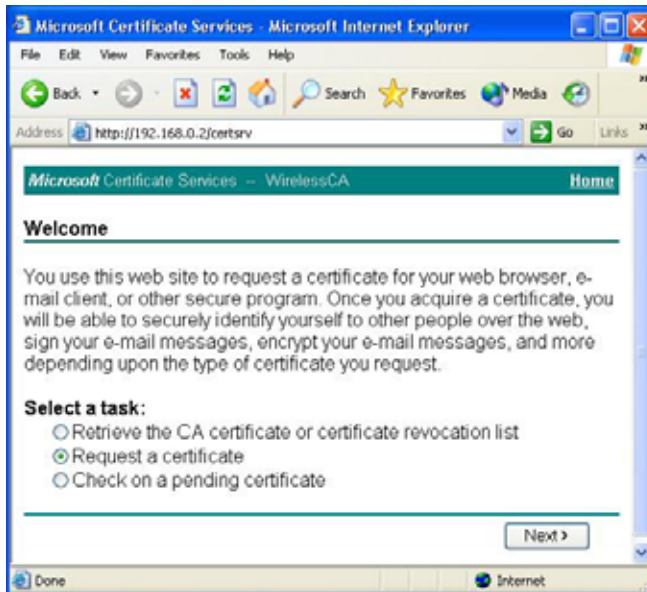
- You are using Windows XP
- You are connecting to a Windows 2000 server for authentication.
- You already have a login (User name and password) on the Windows 2000 server.

4.6.1 Client Certificate Setup

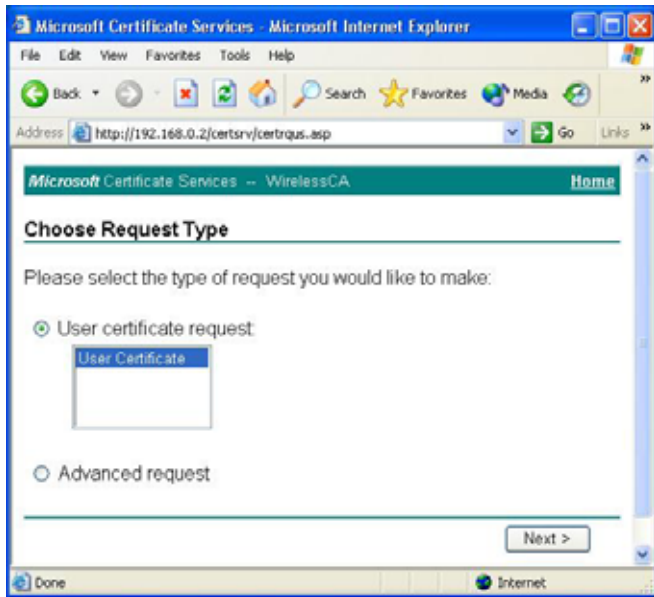
1. Connect to a network which doesn't require port authentication.
2. Start your Web Browser. In the *Address* box, enter the IP address of the Windows 2000 Server, followed by */certsrv*
For example: `http://192.168.1.2/certsrv`
3. You will be prompted for a user name and password. Enter the *User name* and *Password* assigned to you by your network administrator, and click *OK*.



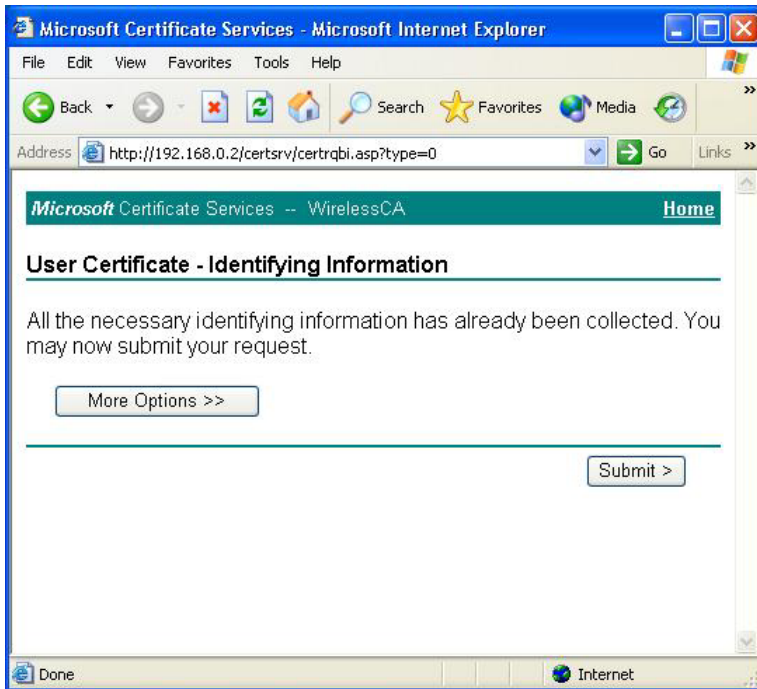
4. On the first screen (below), select *Request a certificate*, click *Next*.



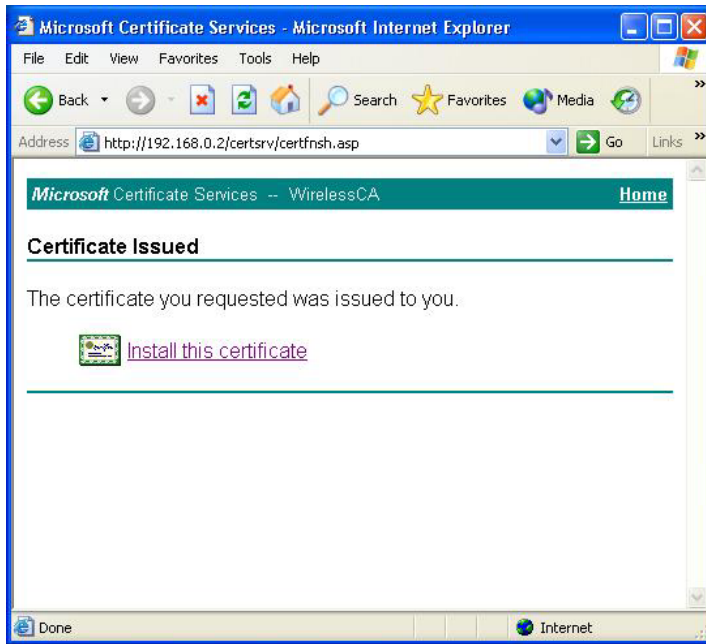
5. Select *User certificate request* and select *User Certificate*, the click *Next*.



6. Click *Submit*.



7. A message will be displayed, then the certificate will be returned to you. Click *Install this certificate*.



8. . You will receive a confirmation message. Click Yes.



9. Certificate setup is now complete.

4.6.2 802.1x Authentication Setup

1. Open the properties for the wireless connection, by selecting *Start - Control Panel - Network Connections*.
2. Right Click on the *Wireless Network Connection*, and select *Properties*.
3. Select the *Authentication Tab*, and ensure that *Enable network access control using IEEE 802.1X* is selected, and *Smart Card or other Certificate* is selected from the EAP type.



Encryption Settings

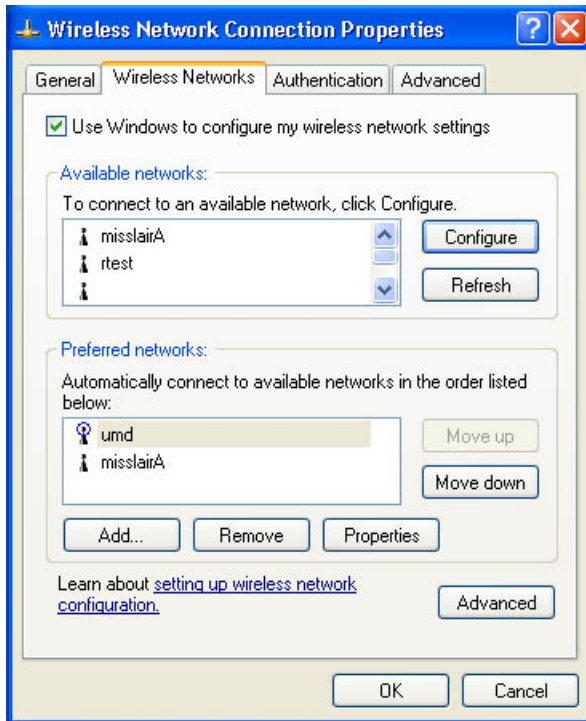
The Encryption settings must match the APs (WDAP-2000PE) on the Wireless network you want to join.

- Windows XP will detect any available Wireless networks, and allow you to configure each network independently.
- Your network administrator can advise you of the correct settings for each network. 802.1x networks typically use EAP-TLS. This is a dynamic key system, so there is no need to enter key values.

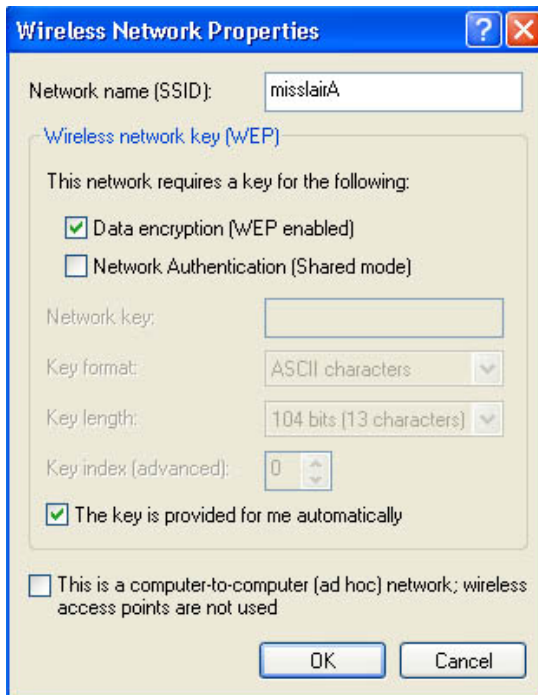
Enabling Encryption

To enable encryption for a wireless network, follow this procedure:

1. Click on the *Wireless Networks* tab.



2. Select the wireless network from the *Available Networks* list, and click *Configure*.
3. Select and enter the correct values, as advised by your Network Administrator. For example, to use EAP-TLS, you would enable *Data encryption*, and click the checkbox for the setting: *The key is provided for me automatically*, as shown below.



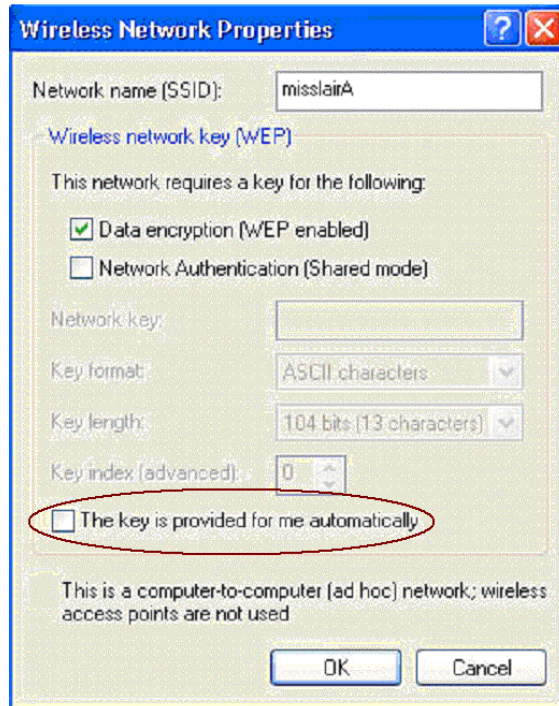
Setup for Windows XP and 802.1x client is now complete.

4.7 Using 802.1x Mode

The procedures are similar to using 802.1x.

The only difference is that on your client, you must NOT enable the setting: *The key is provided for me automatically.*

Instead, you must enter the WEP key manually, ensuring it matches the WEP key used on the Access Point.



Note:

On some systems, the "64 bit" WEP key is shown as "40 bit" and the "128 bit" WEP key is shown as "104 bit". This difference arises because the key input by the user is 24 bits less than the key size used for encryption.

Appendix A

Troubleshooting



Problem 1: Can't connect to the WDAP-2000PE to configure it.

Solution 1: Check the following:

- The WDAP-2000PE is properly installed, LAN connections are OK, and it is powered ON. Check the LEDs for port status.
- Ensure that your PC and the WDAP-2000PE are on the same network segment. (If you don't have a router, this must be the case.)
- If your PC is set to "Obtain an IP Address automatically" (DHCP client), restart it.

If your PC uses a Fixed (Static) IP address, ensure that it is using an IP Address which is compatible with the WDAP-2000PE. (If no DHCP Server is found, the WDAP-2000PE will default to an IP Address and Mask of 192.168.1.1 and 255.255.255.0.) On Windows PCs, you can use *Control Panel-Network* to check the *Properties* for the TCP/IP protocol.

Problem 2: My PC equipped with wireless adapter can't connect to the LAN via the WDAP-2000PE.

Solution 2 Check the following:

- The SSID and WEP settings on the PC match the settings on the WDAP-2000PE.
- On the PC, the wireless mode is set to "Infrastructure"
- If using the *Access Control* feature, the PC's name and address is in the *Trusted Stations* list.
- If using 802.1x or WPA mode, ensure the PC's 802.1x software is configured correctly.

Problem 3: How to improve the stability of my wireless connection?

Solution 3

- Try different antenna orientations for WDAP-2000PE. Keep the antenna at least 6 inches away from walls or obstacles.
- If there are 2.4GHz cordless phones, home security systems, ceiling fans existing in the same environment, the wireless performance will be dramatically dropped. Try to change the operating channel of WDAP-2000PE to avoid interference.
- Keep the wireless devices away (at least 3-6 feet) from electrical devices that generate RF noise, such as microwave ovens, electric motors, etc.

Problem 4: What if I forget the login password of WDAP-2000PE?

Solution 4

If you forgot the password, the only way to recover is to clear the device configuration and return the unit to its original state as shipped from the factory. You can do this by pressing the hardware "RESET" button on the back of the device and hold for five seconds. Please note that this will also clear your current configuration and restore the configuration from the factory default.

Appendix B

Command Line Interface



If desired, the Command Line Interface (CLI) can be used for configuration. This creates the possibility of creating scripts to perform common configuration changes.

Using the CLI - Telnet

1. Start your Telnet client, and establish a connection to the WDAP-2000PE.
e.g.
Telnet 192.168.1.1
2. You will be prompted for the password. Enter the same login password as used for the HTTP (Web) interface.
The default values are **password** for the Password.
3. Once connected, you can use any of the commands listed in the following **Command Reference**.
4. At any time, the users can type a “?” (preceded by a space) to request context-sensitive help on what the user can enter next.
5. If a keyword is expected when the user types “?”, all valid keywords will be displayed. The command typed in so far will then be displayed again along with the cursor sitting at the end, waiting for the user to continue.
6. If the user types in part of the keyword but does not type in the entire word, the user can then enter a tab or space for the system to automatically complete the keyword if the characters typed in so far can uniquely identify the keyword. If the characters typed in so far do not uniquely identify a keyword, a list of possible keywords will be displayed.

Command Reference

The following commands are available.

(1) System Commands

Clear config

Description: Reset the system configuration to the factory default.

Disable upnp

Description: Disable the UPnP function.

Disable wlan management

Description: Disable the management function from a WLAN connected user.

enable upnp

Description: Enable the UPnP function.

enable wlan management

Description: Enable the management function from a WLAN connected user.

help

Description: Show help descriptions on CLI.

logout

Description: Logout the current CLI management session.

ping <IP address>

Description: Show help descriptions on CLI.

reset system

Description: Reboot the system. Any configuration not saved (e.g. by “save config”) will be lost.

save config

Description: Save the current configuration onto the flash, so the configuration will be kept after the system is rebooted.

set http port <port number, 1-65535>

Description: Set the HTTP server port (for device management) to the one specified.

set http timeout <timeout value in minutes, 1-60>

Description: Set the timeout value for the HTTP management session.

set prompt <string up to 15 characters>

Description: Set the command line prompt.

set system contact <string up to 60 characters>

Description: Configure a string describing the system contact information. This is the value of the SNMP system contact MIB.

set system ip

Description: Set the IP address for the device LAN interface.

set system location <string up to 60 characters>

Description: Configure a string describing the system location information. This is the value of the SNMP system location MIB.

set system name <string up to 30 characters>

Description: Configuring a string for the system name. This is also the value of the SNMP system name MIB.

set telnet port <port number, 1-65535>

Description: Set the TELNET server port (for device management) to the one specified.

set telnet timeout <timeout value in minutes, 1-60>

Description: Set the timeout value for a TELNET management session.

show arp table

Description: Display the ARP table of the system.

show http

Description: Display the current configurations of the HTTP management function.

show system

Description: Display the current basic system configurations.

show system ip

Description: Display the current device IP settings of the system.

show telnet

Description: Display the current configurations of the TELNET management function.

show upnp

Description: Display the current configurations of the UPnP function.

show wlan management

Description: Display the current state of WLAN management.

(2) Filtering Commands

add mac filter <string up to 30 characters> <MAC address, XX-XX-XX-XX-XX-XX>

Description: Add a MAC filter with the specified name (a mnemonic name) and MAC address.

delete mac filter <string up to 30 characters>

Description: Delete the MAC filter with the specified name.

set mac filter mode <MAC filter mode, disabled/grant/deny>

Description: Set the MAC filter mode.

show mac filter [<string up to 30 characters>]

Description: Display the MAC filter entry with the specified name. If no name is specified, this command display all currently configured MAC filter entries.

show mac filter mode

Description: Display the currently configured MAC filter mode.

(3) SNMP Commands

disable snmp

Description: Disable the SNMP function.

enable snmp

Description: Enable the SNMP function.

set community string {read | write} <string up to 15 characters>

Description: Configure the SNMP READ/WRITE community string.

show community string read

Description: Display the SNMP READ community string.

show snmp

Description: Display the current SNMP settings.

show snmp statistics

Description: Display the current SNMP statistics.

show trap manager [<string up to 30 characters>]

Description: Display the settings of the specified SNMP trap manager. If no trap manager is specified, this command displays the settings of all trap managers.

(4) Diagnostics Commands

disable log <facility>

Description: Disable the log function on the specified facility.

disable syslogd

Description: Disable the remote log function.

disable trace <facility>

Description: Disable the trace function on the specified facility.

enable log <facility> [<log level, 1-7>]

Description: Enable the log function with the specified log level on the specified facility. If no log level is specified, the previously configured log level is used.

enable syslogd

Description: Enable the remote log function.

enable trace <facility> [<log level, 1-7>]

Description: Enable the trace function with the specified log level on the specified facility. If no log level is specified, the previously configured log level is used.

set log level <log level, 1-7>

Description: Set the log level.

set syslogd <IP address>

Description: Configure the IP address of the remote syslog daemon. This is used for the remote syslog function.

show log level

Description: Display the current log level.

show log table [<facility>]

Description: Display the current logged events of the specified facility. If no facility is specified, this command displays all logged events.

show syslogd

Description: Display the current configuration of the remote log function.

(5) Security Commands

add radius server {primary | secondary}

Description: Configure the primary/secondary RADIUS server settings. This is a multi-line command, and you have to enter the IP address and port number of the server, shared secret, and enable/ disable.

change password

Description: Change the password for management, including HTTP and TELNET.

disable radius mac authentication

Description: Disable the use of external RADIUS servers for MAC address access control.

disable radius server {primary | secondary}

Description: Disable the use of the primary/secondary RADIUS server.

enable radius mac authentication

Description: Enable the use of external RADIUS servers for MAC address access control.

enable radius server {primary | secondary}

Description: Enable the use of the primary/secondary RADIUS server.

set radius server reattempt <retry interval in minutes, 5-60>

Description: Configure the reattempt time for the system to contact the primary RADIUS server after the primary RADIUS server was down.

set radius server retry <retry interval in times, 1-5>

Description: Configure the number of retries after which the system may think the RADIUS server is down.

show radius server [{primary | secondary}]

Description: Display the configuration of the specified RADIUS server. If no server is specified, this command displays the configurations of all RADIUS servers.